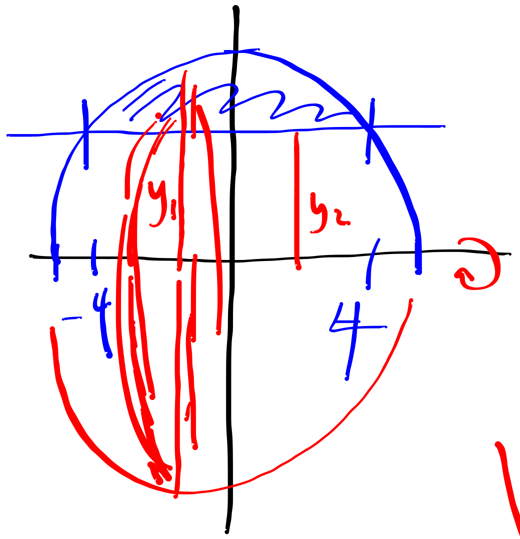
7.2/9

$y=\sqrt{25-x^2}$; $y=3$



$3=\sqrt{25-x^2}$

$9=25-x^2$; $x^2=16$

$x=\pm 4$

$A_{outside}=\pi r_1^2$

$=\pi\left(\sqrt{25-x^2}\right)^2$

$A_{inside}=\pi r_2^2=$

$\pi(3)^2$

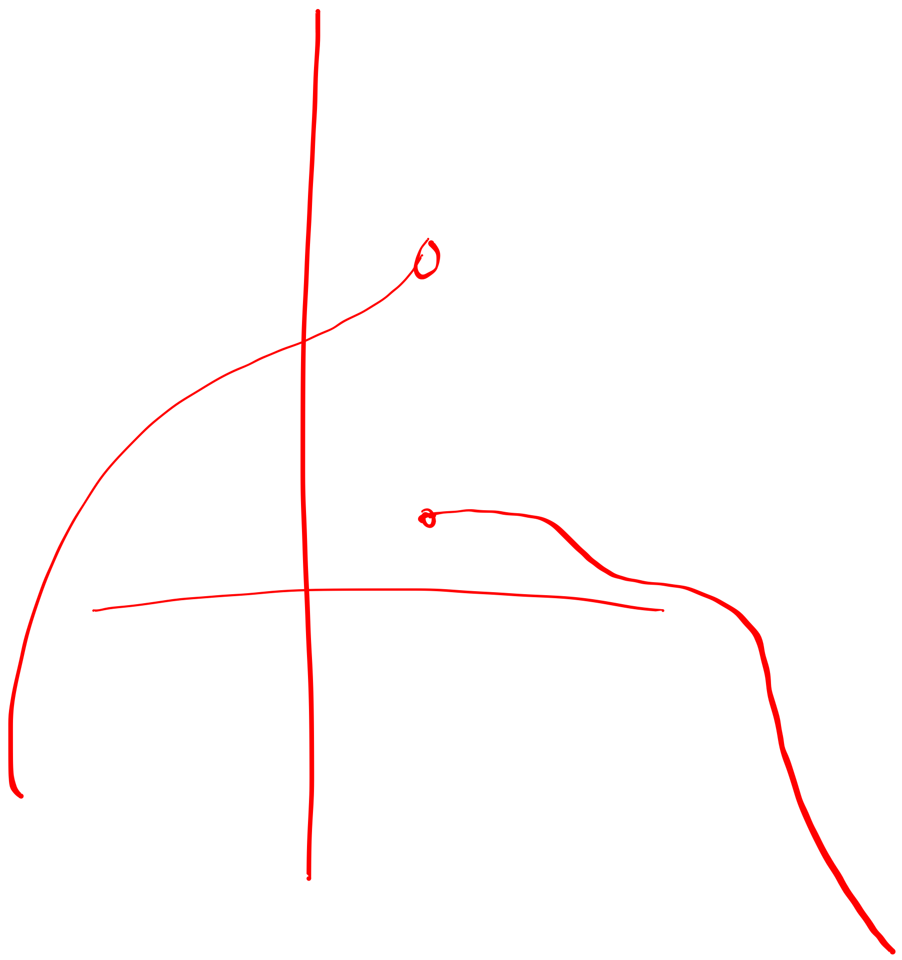
Volume $=\displaystyle\int_{-4}^{4}\pi(25-x^2)-\pi(9)\,dx$

$=\pi\left(25x-\frac{x^3}{3}-9x\right)\Big|_{-4}^{4}$

$=\pi\left(16x-\frac{x^3}{3}\right)\Big|_{-4}^{4}$

$=\pi\left[\left(64-\frac{64}{3}\right)-\left(-64+\frac{64}{3}\right)\right]$

$=\pi\left(128-\frac{128}{3}\right)=\frac{256}{3}\pi$



Jan 27-7:37 AM

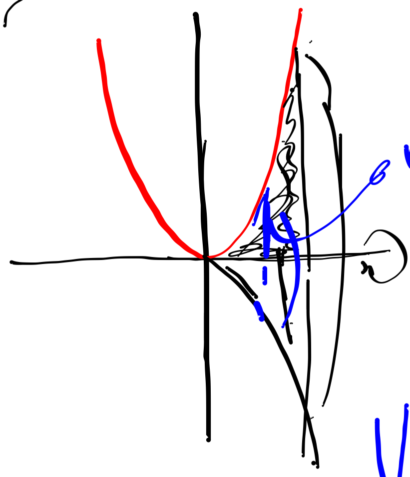
Barrons 89 $f(x) = 5^x$

what is the estimate of of $f'(2)$ obtained by using the symmetric difference quotient with $h = 0.03$?

$$f'(x_0) \approx \frac{f(x_0+h) - f(x_0-h)}{2h}$$

$$= \frac{5^{2.03} - 5^{1.97}}{.06} \overset{\text{calc.}}{\approx} 40.252$$

7.2/5) $y=x^2$; $y=0$; $x=0$; $x=2$



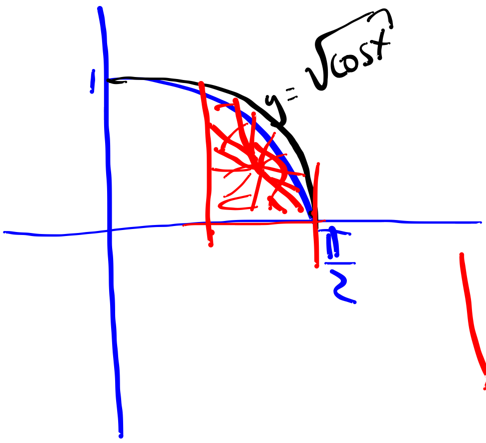
$r=y$

$A_{x\text{-section}} = \pi r^2 = \pi y^2 = \pi (x^2)^2$

$$V = \pi \int_0^2 x^4 \, dx = \pi \frac{x^5}{5} \Big|_0^2 = \frac{32\pi}{5}$$

Jan 27-7:37 AM

7.2/7) $y=\sqrt{\cos x}$; $x=\frac{\pi}{4}$; $x=\frac{\pi}{2}$; $y=0$

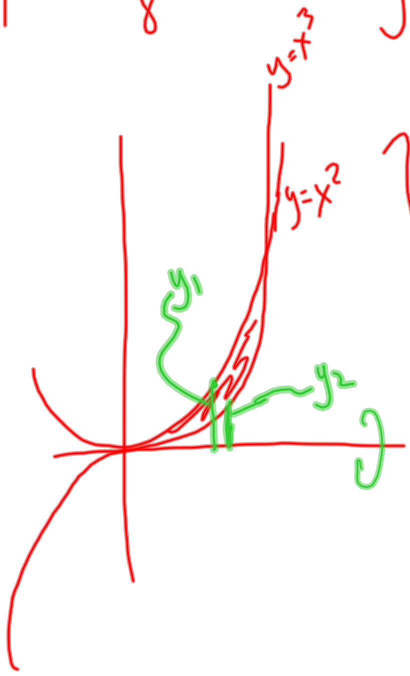


$$A_{xs}=\pi r^2=\pi y^2=\pi\left(\sqrt{\cos x}\right)^2$$
$$=\pi\cos x$$

$$V=\pi\int_{\pi/4}^{\pi/2}\cos x\,dx$$

$$=\pi\sin x\Big|_{\pi/4}^{\pi/2}=\pi\left(\overset{\sin\frac{\pi}{2}}{1}-\overset{\sin\frac{\pi}{4}}{\frac{\sqrt{2}}{2}}\right)$$

$9 = \frac{7.2}{8}$ $\quad y = x^2 \; ; \; y = x^3$



$x^2 = x^3$

$x^3 - x^2 = x^2(x-1) = 0$

$x = 0, 1$

$A_{\substack{\text{cross}\\\text{section}\\1}} = \pi r^2 = \pi (y_1)^2 = \pi (x^2)^2$

$A_{\substack{\text{cross}\\\text{section}\\2}} = \pi r^2 = \pi (y_2)^2 = \pi (x_3)^2$

So $\text{Volume} = \pi \int_0^1 (x^4) - (x^6)\,dx = \pi \left[\frac{x^5}{5} - \frac{x^7}{7} \right]_0^1$

$= \pi \left(\frac{1}{5} - \frac{1}{7} \right) = \frac{2\pi}{35}$

x^2 x^3 from 0, 2

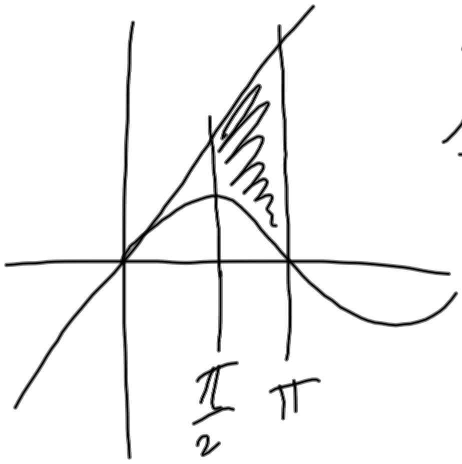
$$\int_0^2 x^3 - x^2 \, dx$$

$$\frac{x^4}{4} - \frac{x^3}{3} \Big|_0^2$$

$$\frac{2^4}{4} - \frac{2^3}{3} = \left| 4 - \frac{8}{3} \right|$$

$\int_0^1$

WS/2 . . . $y = \sin x; y = x; x = \frac{\pi}{2}; x = \pi$



$$\text{Area} = \int_{\frac{\pi}{2}}^{\pi} x - \sin x \, dx$$

$$= \left(\frac{x^2}{2} + \cos x\right)\Big|_{\pi/2}^{\pi}$$

$$= \left(\frac{\pi^2}{2} + {}^{-}1\right) - \left(\frac{\pi^2}{8} + 0\right)$$

$$= \frac{\pi^2}{4} - 1$$

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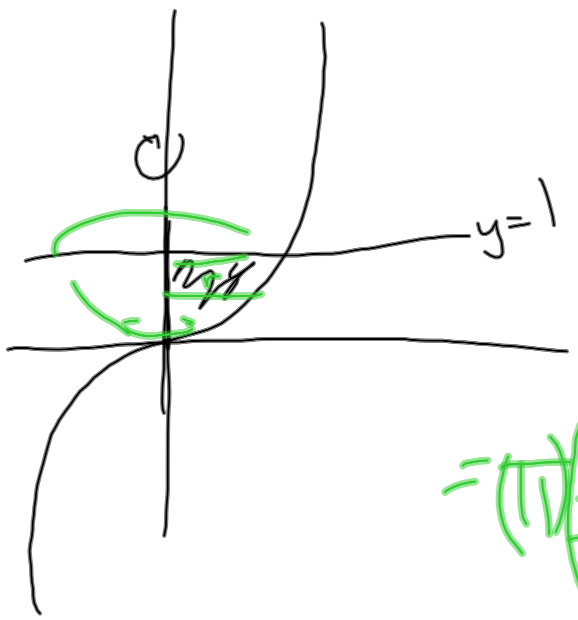
7.2/17)

$y = x^3;\ x = 0;\ y = 1$



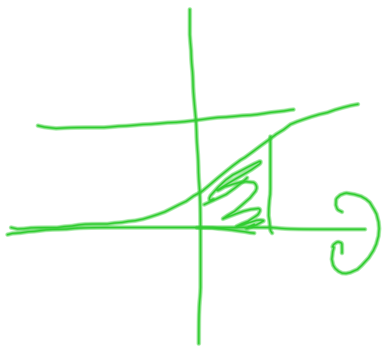
$r = x = \sqrt[3]{y} = y^{1/3}$

$\text{Volume} = \pi \int_0^1 (y^{1/3})^2\, dy$

$= (\pi)\left(\frac{3y^{5/3}}{5}\right)\Big|_0^1 = \frac{3\pi}{5}$

7.2/16

$y = \frac{e^{3x}}{\sqrt{1+e^{6x}}}$, $x=0$, $x=1$, $y=0$



$$V = \int_0^1 \pi \left(\frac{e^{3x}}{\sqrt{1+e^{6x}}}\right)^2 dx$$

$$= \pi \int_0^1 \frac{e^{6x}}{1+e^{6x}} dx = \frac{\pi}{6}\int_2^{1+e^6} \frac{1}{u}\,du$$

$u = 1+e^{6x}$

$du = 6e^{6x}dx$

$\frac{1}{6}du = e^{6x}dx$

$x=0 \Rightarrow u = 1+1 = 2$

$x=1 \Rightarrow u = 1+e^6$

$$= \frac{\pi}{6} \ln|u| \Big|_2^{1+e^6}$$

$$= \frac{\pi}{6}\left(\ln(1+e^6) - \ln(2)\right)$$

.0000215

.5 cm = .005 m

$.0003927 m^3$

$\pi r^2 \cdot h = \pi(.005^2) \cdot 5 =$

$\pi(.0025 \cdot 5)$

$\boxed{.0125\pi}$

$\pi\ m^3$

$\rho = \frac{m}{V}$

$.3927 kg \cdot 9.81 =$

3.84846